A BRIEFE DESCRIPTION OF VNIVERSAL MAPPES AND CARDES, AND OF THEIR VSE: AND ALSO THE VSE OF PTHOLEMEY his Tables.

Neceſſarie for thoſe that DELIGHT IN READING OF Hiſtories: and alſo for Traueilers by Land or Sea.

Newly ſet foorth by THOMAS BLVNDEVILLE, *of Newton Flotman in the Countie of Norffolke. Gent.*

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¶ TO THE RIGHT VVORSHIPFVL M. *Francis Windam, one of the Iudges her Maieſties Court of Common Pleas.*

GOOD Sir, vouchſafe to receiue this poore litle Pamphlet, partlie as in lieu of a richer Nevvyeares gift, and partlie as a token of my thankefull minde, which is more vvilling then able to deſerue any one iotte of the great fauour, friendship, and diuers benefites that I haue from time to time receiued at your hands: for want of which abilitie I neither can, nor vvill looſen my ſelfe from any of thoſe bondes, vvherewith you haue moſt ſtraightlie bound me, but rather to increaſe the ſame, humbly praying you to continue in your good loue and fauour tovvards me, vntill I ſhall willinglie deſerue the contrarie: In the meane time I pray God to proſper you in all your doings, and long to preſerue you.

From my poore Swans neſt. 17. *Decembris.* 1588.

Your olde vvelvviller, bound to be alwaies at your commaundement.

Thomas Blundeuille.

To the Reader.

I Daylie see many that delight to looke on Mappes, and can point to England, France, Germanie, and to the East and West Indies, and to diuers other places therein described: but yet for want of skill in Geography, they knowe not with what maner of lines they are traced, nor what those lines do signifie, nor yet the true vse of Mappes in deed: Wherefore, somewhat to instruct those that haue not studied Geographie (without the knowledge whereof me thinkes that the necessarie reading of Histories is halfe lame, and is neither so pleasant, nor so profitable as otherwise it would be) I thought good to write this little Treatise: in reading whereof, if you reape any profit thereby, I pray you bee thankeful to the Right Worshipful, and my especiall good friend, M. Francis Windam, *one of the Iudges of her Maesties Court of Common Pleas, who first motioned me thereunto, and by whose perswasion I haue the more willingly put the same in Print.* Vale.

Certaine

CERTAINE TEARMES OF COSMOGRAgraphie, briefflie expounded, for those that are not *learned in that science, to the intent they may the better vnderstand this Treatise.*

THe Axle tree of the Worlde is a right line, imagined to passe throughe the Center or midst of the earth, from the one ende of heauen to the other: the vpper ende of which Axle tree is called the Pole Artike, that is to say, the North Pole: & the nether end, the Pole Antartike, that is, the South Pole: vpon which two Poles, otherwise called the hooks or hengils of the world, the heauens doe turne rounde about the earth. Moreouer the Cosmographers doe deuide the worlde into diuers partes by certaine Circles, whereof some are called greater, and some lesser. The Axle tree of the world. The two Poles.

The greater are those which doe deuide the world into 2 equall partes: whereof there be 6: that is, the Equinoctiall, the Zodiake, the Meridian, the Horizon, and the 2 Colures. The greter Circle.

The Equinoctiall is a great Circle, girding the world in the verie midst betwixt the 2 Poles, by reason whereof there are two latitudes, the one Northern, & the other Southerne. The Equinoctiall.

The Northerne latitude is that space, which is conteined betwixt the Equinoctiall and the North Pole. The north latitude.

The Southerne latitude is that space, which is conteined betwixt the Equinoctial & the South Pole: and either of these two spaces conteineth in bredth 90 degrées. The South latitud.

A Degree. A Degrée is one part of a Circle, béeing deuided into 360 partes called degrées.

Longitude. Againe, the circuit of the Equinoctial, containing 360 degrées, is the verie longtitude of the Earth: the first degrée of which longitude beginneth at the the first Meridian, placed in the West, and so proceedeth Eastward vnto the 180 degrée of the Equinoctiall, and from thence returneth by the West vntill you come againe to the 360 degree, which is the last degree of longitude. And note by the way that euerie degrée of the Equinoctiall containeth 60 English miles, so as the longitude of the whole Earth is 21600 miles.

The Zodiake, The Zodiake is a great, broad, and slope or shoring Circle, carrying the 12 Signes: in the middest whereof is a line called the Ecliptike line, from which the Sun neuer swarueth.

The Meridian The Meridian is a greate Circle, passing ouer our heades, in what parte of the World soeuer we be, and also through both the Poles: which line when the Sunne toucheth it aboue the Horizon, it is Nonetide or midday to those that dwell vnder the same.

The Horison. The Horizon is a great Circle, deuiding the vpper halfe of the World which we see, from the nether halfe which wee see not: in the the very middest or Center of which Circle, if in a plaine field you looke rounde about you, you shall alwaies finde your selfe to be.

The 2 Colures Now as touching the two Colures, because they differ not in effect, though in name, from two Meridians, I leaue to speake of them, aswell for that I haue spoken of them at large in my Sphere, as also for that they are not mentioned in this Treatise.

4 lesser circles Of the lesser Circles there be foure: that is, the two Polar Circles, and the two Tropikes. Of the two Polar Circles, the one enuironeth the North Pole, & therfore is called the Circle Artike, & the other enuironeth the South Pole, and is called the Circle Antartike, bé-

The Circles Artike and Antartike.

cause

cause it is opposit to the other.

Again, of the two Tropiques, the one is placed betwixt the Equinoctiall and the Circle Artike, and is called the Tropike of Cancer: and the other is placed betwixt the Equinoctiall and the Circle Antartike, and is called the Tropike of Capricorne: and each of these Tropikes is distant from the Equinoctiall 23 degrees and a halfe, which is the greatest declination of the Sun from the Equinoctiall, for he neuer mounteth higher then the Tropique of Cancer, nor descendeth lower then the Tropike of Capricorne, and these two Circles are Paralels to the Equinoctiall.

The Tropike of Cancer.

The Tropike of Capricorn.

The greatest declination of the Sun.

Paralels are 2 lines or Circles, equally distant in all places one from another. And by these foure lesser Circles the Earth is deuided into 5 Zones or broade spaces, whereof there be two colde. 2 temperate, and one hotte described both in my Sphere and also in this treatise.

Paralels.

Zones.

A Paralell of the longest day, is a spare of the Earth, wherein the day increaseth by one quarter of an hower, proceeding from Equinoctiall towards any of the Poles.

A Paralell of ye longest day.

A Clyme is a spare of the Earth, conteining two such Paralells wherein the day increaseth by halfe an hower, of which Clymes according to the old Writers, there be 7 declared at the full in my Sphere, and also somewhat touched in this Treatise.

A Clyme.

A Briefe Description of vniuersall Mappes and Cardes, and of their vse, and also the vse of Ptholomey his Tables.

THis woord *Mappa* in latin signifieth a Table cloth of lynnen to couer a board: of the shape and likenes whereof vniuersall tables, containing the description of the earth, are commonly called Mappes. And first you haue to vnderstande, that euery such Mappe is chiefly traced with .v. sortes of lynes or circles, that is Meridians and paralels. The Meridians are either right or circular lynes passing through both the Poles of the worlde, and are imagined to be drawen right vp and downe from the head to the foote of the Mappe, and are called Meridians, of this Latin woord *meridies*, which is as much to say as midday or nonetyde. Because that when the Sunne commeth to touch any of those lynes, it is myddaye to those that dwel right vnder the same. Againe, Paralells are either right or circular lynes imagined to be equally distant one from another, which doe crosse the foresaid Meridians with right angles. Now in the verie midst of the Map is most commonly drawne from head to foote a ryght lyne which signifieth not onely the first Meridian, but also the Axle tree of the world, the vpper ende of which lyne is called the pole Artique, that is to say the North Pole, and the neather end the Pole Antartique, that is the South Poole, and this lyne is crossed in the verie midst betwixt the .v. Poles with another great circle or right lyne called the *Equinoctiall*, because that when the Sunne commeth to touch this lyne or circle, the day and

nyght is equall throughout the world. The one halfe of which lyne toward the right hand sheweth the east part, and thother half towards the left hand sheweth the west part of the world: so as these .v. lynes, the first *Meridian* and the *Equinoctiall* do point out the iiij. quarters of the world, North, South, East, and West, from whence the foure principall wyndes do blowe betwixt: which wyndes are set downe in most Pappes together with their Latin or Italian names in the outermost skirt or border thereof viij. other wyndes, so as in all there be xij. wyndes, whereby the auncient Greekes and Romanes were wont to saile. The names whereof both Greeke, Latin and English are heretofore set downe in the latter end of our Sphere.

But now to returne to our first two lynes, that is the first *Meridian* and the *Equinoctiall*, you have to note that both these lynes or circles are deuided each of them into 360. degrees, so as euery quarter of them contayneth 90. degrees. And in the *Equinoctiall* are set downe the degrées of longitude, which is the length of the worlde, round about from West to East, and againe from East by West home againe: The first degrée whereof beginneth, whereas the first aforesaid *Meridian* crosseth the *Equinoctiall* in the verie middest of the Pappe, and so proceedeth Eastward vnto the number of 90 degrées, which is as farre as you can goe Eastward, sith from thence by reason of the roundnesse of the Earth, you must néedes turne backe againe by the backe side of the Sphere, or ball Westward, vntill you come to the 270 degrée, which is the farther point westward you can goe, from whence you must returne Eastward vntill you come to the 360 degrée, which is the last degrée of longitude, and endeth where the first degrée beginneth.

Moreouer in the said first *Meridian*, or in some other *Meridian* hard by it, are set downe the degrées of latitude, that is to say, the breadth of the worlde, both Northerne

therne and Southerne: for from the *Equinoctiall* to the North Pole are contained in the foreſaide *Meridian* 90. degrées, and that is called the North latitude, and from the *Equinoctial* to the South Pole, are contained in ỹ ſaid *Meridian*, other 90 degrées, which is called the South latitude: and in moſt Mappes the *Equinoctiall* line is deuided and croſſed with 18 *Meridians* on each ſide of the firſt *Meridian*, deuiding the *Equinoctiall* into 36 ſeuerall ſpaces or diſtances, euery ſpace conteining 10 degrées, and euerie degree containeth 60 Italian myles of length.

Moreouer betwixt the *Equinoctiall* and each of the Poles are drawen certaine Circles or lines, called (as I ſaid before) Paralels: of which moſt commonly 4 are painted with red inke, ſignifying the 4 leſſer Circles before deſcribed in our Sphere, whereof the higheſt towards the North Pole, is called the Circle Artique, beeing diſtant from the Pole 23 degrées and a halfe, and the loweſt towards the South Pole is called the Circle Antartique, beeing alſo diſtant from the Pole 23 degrées and a halfe.

Now as touching the other two red Circles, the one lying betwixt the Circle Artique, and the *Equinoctiall* is called the Tropique of *Cancer*, and the other lying betwixt the *Equinoctiall* and the Circle Antartique is called the Tropique of *Capricorne*, and each of theſe two Tropiques is diſtant from the *Equinoctiall* 23 degrées and a halfe, which is the greateſt declination of the Sunne, for betwixt theſe ỹ. Tropiques the Sunne continuallie maketh his courſe and returne, as this word Tropique ſignifyeth, mounting neuer higher then the Tropique of *Cancer*: nor diſcending lower then the Tropique of *Capricorne*: for which cauſe ſome doe ſet downe in their Maps betwixt the ſayde two Tropiques an ouerthwart line, ſignifying the ecliptique line, vnder which the Sun continually walketh. Now by helpe of the foreſaide 4

circles, the earth is deuided into 5 zones, that is, one whotte, 2 temperate, and 2 cold. The whotte is contained betwirt the 2 Tropiques, in the midst of which whotte zone, is the Equinoctiall line, and of the 2 temperate zones, the one lieth betwirt the Tropique of *Cancer* and the circle Artique, and the other betwirt the Tropique of *Capricorne* and the circle Antartique.

Againe, of the 2 colde zones, the one lyeth betwirt the North Pole and the circle Artique, and the other betwirt the South Pole, and the circle Antartique. Powe besides these foure speciall Paralels, there bee diuers other Paralels drawne on each side of the Equinoctiall, both Northward and Southward, which crossing in certaine points the first Meridian marked with degrees, do shew the true latitude of euery place, and vnder what Clime or Paralell it is, and also how many howers the longest day of any place vnder euery Paralell is, beginning to accompte the same, eyther from the Equinoctiall vpward towardes the North Pole, alongst the first Meridian marked with degrees of Northerne latitudes, or els from the sayde Equinoctiall downe-warde towardes the South Pole, marked with degrees of Southerne latitude.

Notwithstanding, they vse most commonlye to set downe the number and iust distaunces of the Clymes, Paralels, and howers in the North latitude onely, willing the like numbers of Clymes, Paralels, and howers to bee accompted in the South latitude, euen as they are in the North latitude and with like distances. And note that in proceeding towardes the Pole from the Paralell, whereas the longest day is 24. howers, they accompte the Paralell of the longest daye no longer by howers, but by monethes, that is to saye, from one moneth to sir monethes, whereof wee haue spoken before in our sphere. The numbers of the aforesayd Clymes, Paralels and howers you shall finde set forth in *Vopellius*.

his Mappe alongest the first Meridian on the left hand. But hee setteth downe the numbers of the longest daies encreasing by monethes in the vttermost border of hys Mappe on the right hand betwixt the North Pole, and the circle Artique. And in that border hee setteth downe the number of leagues and miles answerable to euery Paralell, whereas also hee sheweth the three differences of Inhabitants according to their shadows, that is to say. the *Periscij*, *Heteroscij*, and *Amphiscij*.

Periscij are those that dwell in anie of the two colde zones, whose shadowe goeth round about them.

Heteroscij be those that dwell in anie of the two temperate zones whose shadowe tendeth at noone-tide but one waie, that is either North or South.

Amphiscij bee those that inhabite the whotte zone, whose shadowe tendeth both waies, that is sometime North and sometime South, as is before declared at large in our sphere.

But in the Mappe of *Gemma Frizius*, you shall find all these thinges set forth on the left hand of his Mappe amongest the vttermost circles, whereas vpon the circle Artique, hee setteth downe the twelue signes, hauing certaine compassed lines, running downe to the Equinoctiall, meeting and concurring all in one point: at the end whereof vpon the Equinoctiall, you shall finde the number of howers, at which the sunne riseth in euery degree of latitude.

Also at the nether ende of hys Mappe on the left hand, he placeth a halfe quadrant, which hee calleth *Directorium nauticum*, whereof wee shall speake hereafter.

And because he would haue hys Mappe to serue both sea and land, he setteth downe a certaine number of mariners compasses deuided with 32 lines signifying the 32. windes, which doe shewe howe euery place beareth one from the other, and by what winde a Shippe is to bee

directed from one part to another, which thing is alſo obſerued in *Mercators* Pappe and others that haue written more lately, and yet nothing ſeruiceable for the Sea, becauſe (as M *Borough*, Controller of her Maieſties Nauy, a man moſt skilful in the Art of ſailing ſaith) no conſideration is had in the ſaid Paps or Cards touching ỹ variation of the Compaſſe, without the which they can neuer ſet downe any true or iuſt direction.

Now as touching the diuiſion and order of the partes of the Earth, moſt commonlie deſcribed in vniuerſall Pappes, you ſhall vnderſtand that the ancient Coſmographers, not knowing then the Weſt *Indies*, nor manie other places ſcituated both Northward and Southward (which haue bene ſince diſcouered) deuided the whole Earth onely into three partes, that is, *Europe*, *Aphrike* and *Aſia*, in the deſcription whereof, their Pappes neuer extended in latitude Northwards further then to 63 degrées, as I haue ſaid before in my Sphere, and Southward no further then to 20 degrées of the Northerne latitude, or there about, but in longitude from Weſt to Eaſt, beginning the ſame at the Ilandes called Inſulæ Canariæ or Fortunatæ, which are ſcituated at the Weſt end of *Aphrike*, in the Sea called Mare Atlanticum: their deſcriptions doe extend to 180 degrées. But becauſe a whole worlde almoſt hath bene founde out ſince thoſe times, our moderne Coſmographers doe deuide the whole Earth into 4 partes: that is *Europe*, *Aphrike*, *Aſia* and *America*, which we nowe call the Weſt *Indies*. And becauſe men of diuers Nations haue ſayled round about the world, Eaſt and Weſt, their late deſcriptions doe extend in longitude the whole content of the Equinoctiall, which is 360 degrées: and in latitude Northwards, the ſame deſcriptions doe extende to 80 degrées: and Southwards to 66.½ as you may ſée in the vniuerſall Pappes lately ſet forth by *Mercator*, and by *Barnardus Puteanus* and others.

But

But the ancient and moderne doe greatly differ in the diuision of the partes of latitude, as well Northerne as Southerne, and also in longitude: for, whereas the ancient Cosmographers doe deuide each latitude into 90. degrées by certaine Paralels making 9. equall spaces, euery space containing 10. equall degrees: in the latter Mappes last mencioned, you shall finde those spaces and the degrées thereof altogether vnequall, the first 3 spaces next the Equinoctiall onely excepted, for those differ not aboue one halfe degree at the most: but from thence Northward, euery space is greater then other, and euery degree in euery such space is greater then other, insomuch as the fourth space containeth 11 degrées and a halfe of those degrees which are set downe in the first space, and the fift space conteineth of such degrees 13 degrées $\frac{3}{4}$, the 6 space containeth of the said degrées 16 degrées $\frac{1}{4}$: the 7 containeth of the same degrées 20 degrees $\frac{1}{2}$, so as the space is is twise so broade as the first space and one halfe degree more: the eight space conteineth of the said first degrees 36: further then which 8 spaces containing 80 degrees of latitude, their Mappes extend not Northward: and they obserue the like proportion in the Southerne latitude, sauing that they extende no farther Southward then to 66 degrees and a halfe.

Againe, they differ in longitude thus: for the moderne Cosmographers doe make the first Meridian to passe through the Iles called *Azores*, which doe stande 5 degrees more Westward then the *Fortunate* Islands do: through which *Fortunate* Islandes, *Ptolomey* and his followers doe appoint the first Meridian to passe.

The cause of which transposing the saide first Meridian is, because that the mariners Compasse doth neuer shewe the right North and South, in any other place, but onely vnder that Meridian. Yea M. *Borough* thinketh that it would shewe it more truely, if the saide Meridian were placed somewhat more Westward. But in

thoſe Cardes and mappes that are made according to the rules of *Ptolomey*: the ſpaces of Paralels containing the 90. degrées of latitude, both Northwarde and Southward, are equall, and all the degrées of euery ſuch ſpace, are alſo equall. And yet the ſpaces of Paralels that ſhew the longeſt day in any place, are towards the Pole, euery one more narrowe then other: for as I haue ſayd before in my ſphere, there are 3 kinds of paralels, that is Paralels of the Sunne, Paralels of the latitude, & Paralels of the longeſt day. The cauſes why in theſe latter Maps, the degrées of latitude are made greater and greater towards the Poles, are ſet downe by *Barnardus* in his vniuerſall Mappe, who ſayth there, that in making the ſaid Mappe, he had 3. ſpeciall cares: Firſt, that the places might be ſo ſcituated, as they may haue both true direction and diſtance, and alſo due longitude and latitude, and as nigh as may bee, the ſame very ſhape which they haue in the ſphere or globe, to which end hee hath inuented a new proportion or habitude of the Meridians to the paralels, affirming that the Maps before made, are not fit for Nauigation, by reaſon of the crookednes and bowing of the meridians, which by their oblique & ouerthwart falling into the Paralels, doe ſo much diſſigure in the vttermoſt parts, the true ſhape of the Regions as they can ſkant be knowen. And as for the mariners Cardes, becauſe their Paralels of latitude are alſo of equall diſtance from the Equinoctiall to the very Pole; he ſayth that they muſt needes miſſaſhion the Regions and make the directions, diſtances, longitudes, and latitudes to be vntrue, and thereby cauſe great errors. Which to auoyd, hee maketh the ſpaces of his Paralels and degrees of latitude to encreaſe by little and little towardes the Pole, affirming that thereby all places ſhall haue their true ſhape, and alſo their true directions, diſtaunces, longitudes, and latitudes.

His ſecond care was, that the Regions and places, might

might haue their true quantitie and greatnes, and alſo true diſtance one from another, wherin he hath taken as he ſaith, greateſt paines whileſt he did confer the Tables of the *Caſtilians* and *Portugales* aſwell amongeſt themſelues, as with diuers other Nauigations both printed and written. His third care was to ſhew what partes of the world were knowen to the auncient men, that the limits and bounds of their Geographie might not bee vnknowen, to the intent they might haue their due honour and praiſe. And hauing ſhewed what places they did in their time deſcribe both Eaſt, Weſt, North, and South, in the end of his ſpeach, he affirmeth, that auncient Coſmographers haue ſet down in the Eaſt *Indians* more places, then euer the *Portugales* haue as yet diſcouered or attained vnto.

This *Barnardus Puteanus* borne in *Bruges*, is by his owne confeſſion a Cutter or Grauer in braſſe, and alſo a Coſmographer, whoſe Mappe ſet foorth in the yeare of our Lord 1579. doth not differ in any one point that I can finde from the laſt vniuerſall Mappe of *Mercator* that famous Coſmographer, who as I vnderſtand was himſelfe alſo ſometime a Cutter & Grauer of ſuch Maps and Globes as *Gemma Frizius* did cauſe to bee printed in his time, from whom *Mercator* learned great part of his moſt excellent ſkill in Coſmographie. But of one thing I am ſure, ẏ *Ptolomey* was firſt Maiſter to them all, who hath ſet down ſo good and perfect rules of deſcribing the Earth, be it whole or part, as in the opinion of moſt learned men, no better can be inuented.

Truely when I did firſt beholde theſe latter Maps, and ſawe that the Paralels towardes the Pole were as long as the verie Equinoctiall it ſelfe, it ſeemed to mee ſomewhat ſtraunge, for then I ſaid that a Shippe in ſayling about the world vnder the Paralell of 60 degrees, ſhould by this meanes make as long a voyage as that which ſaileth about the world right vnder the Equinocti-

all, which voyage is twice as long. For this containeth in longitude 21600 miles, which is the whole compasse of the Earth, and the other containeth in longitude 10800 miles, which is iust halfe so much and no more. But after that I had taken better aduisement thereof, I found by measuring with my compasse, that one degree of the Meridian next to the 60 degree of latitude, did comprehend two of such degrees, as are set downe in the Equinoctiall, and that one degree of the Meridian, crossing the the Paralel that hath 70 degrees of latitude, did comprehend 3 degrees of the Equinoctiall line, and so I found the degrées towards the Pole, to ware greater and greater, by which degrees I perceiued their meaning was to haue the longitude of their paralels to be measured, & not by the degrées of the Equinoctiall. And by ý meanes their paralels should haue ech one as nigh as might be his due longitude proportionally, euen as they haue in the globe.

Moreouer the shape, quantities, and distances of such Countries as haue beene found out of late daies must néeds bee more perfealy set forth in these Mappes, then in those ý haue bene made hertofore, because the true longitudes & latitudes of those places were not so wel known then as they are now. Albeit I feare mee that of many places in the *Indies*, there are as yet but fewe true longitudes known. For it is not so easie a thing to get the true longitude of euery place, as the true latitude thereof. And had not the late makers of Maps bene greatly holpen by the Maps and Cards of such learned Pilots as haue traueiled those Countries, I doubt not, but that they should haue committed as great errours as those that wrote before them. And of one thing I doe assure my selfe, that in these latter Mappes, more places are described, then euer were knowen or discouered: as for example, the North-parts of *Groyneland*, *Crockland*, & *America*, all which they make Ilands, and yet neuer sayled about them, and specially on the North side, as it may wel be gathered by the

vaine

vaine attempting of diuers Nations, to finde out newe waies in the North ſeas to the *Molucas* both by Eaſt and Weſt. For being a little entred into thoſe ſeas, they are quickly driuen backe, either by extreame colde, by great Yles, or by the raging floods bred of ſnowe, and falling from the mountaines of the next continent, and making in ſome places ſuch Whirlepooles in the Sea, as if any Shippe chance to come nigh them, it is ſone ſwallowed vppe. Neither doe I thinke, that *King Arthur* in hys time, euer ſent (as it is reported) any of his people to inhabite thoſe Iſlands, beeing places in mine opinion, more méete for Whales and monſtruous fiſhes to dwel in, then for men: and ſpecially for Engliſh men, which are not able to ſuffer the cold winter at *Wardhouſe*: to which place ſome of our Mariners do ſaile in Sommer ſeaſon euerie yeare. And yet *Wardhouſe* hath ſkant in latitude 71 degrées, much leſſe then are they able to winter in thoſe places that haue 77 degrees of latitude, as the North ſide of *Groynland* and *Crockland* hath. Moreouer the North ſide of the promontorye *Tabin* hath 76 degrées of latitude, which place, whatſoeuer *Plinie* ſaith therof in his fourth booke of Hiſtories, yet I beleeue that no Roman came euer there to deſcribe ỹ Promontory. Neither doe I beléeue that the Fryer of *Oxford*, by vertue of his Art Magicke euer came ſo nigh the Pole to meaſure with his Aſtrolabe thoſe colde parts togither with the foure floods, which *Mercator* & *Barnardus* do deſcribe both in the front, and alſo in the nether end of their Maps, vnleſſe hee had ſome colde deuil out of the middle Region of the aire to be his guide. And therfore I take them in mine opiniõ to be méer fables. Truly if any men ſhould diſcouer thoſe parts, me thinketh that the people of *Finmarke* & of *Wardhouſe* or ſuch like people bordering vpon the North ſeas, ſhould beſt doo it, hauing bodies vſed to extreame colde. But then being bred in ſo groſſe an aire, their wits perhaps are too groſſe for ſuch a purpoſe.

I remember that *William Boorne* in his booke called the *Regiment of the Sea*, secteth downe fiue sundrie waies to saile into *Cathay*, whereof the first way is by the Cape of good hope in the outermost south part of *Affrike*: The second by the Sea called Mare Magellanicum. The third waye is to saile betwixt the North part of *America* and the Iles of *Groynland* and *Crockland*. The fourth is by *Noua Zemla*, whereas Sir *Hughe Willoughby* in seeking that way was frozen to death. The first way is to sayle right vnder the Pole, that is first from South to North, vntill you be right vnder the Pole, and then from North to South, alledging there certaine reasons to proue the three last waies possiblie to be as passable, as the first & waies well knowen in these daies and vsually haunted.

The strongest reason that *Boorne* vseth to make the foresayd Seas Nauigable, is, for that the Sun by his long tarrying aboue the horizon, so warmeth both land and Sea, as it cannot bee ouer soone colde againe. But I pray you what heat can the Sunne yéelds to that place aboue whose Horizon he is neuer eleuated more then 23. degrées and a halfe, a verie colde winterlie heat GOD wotte. And though the colde were not so extreame as I take it to be indéed, yet in desert places, where is there any safe harborow, fresh water, or any other necessary succor to be had? For in taking such a iorny, let no man think to goe through without a bait, vnlesse he saile in *Pegasus*, and hath both winde and tide at will.

Notwithstanding, I can greatly commend those valiaunt mindes that doe attempt such desperate voyages, and the rather when they doe it for knowledge sake, and to profite their Countrey, and not altogether for priuate gaine and lucre.

But truly for mine owne part, I thinke it vnpossible that any man bred in any of the temperate zones or in the hotte zone is euer able to continue the whole iour-

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ney in any of those 3 waies: no, though they were much more passable then I take them to be indéede. But if they were passable in all respects, saving for cold, then I think no Nation or people so méete to attempt those waies as those which I haue already named, or such like, borne and bred nigh vnto the North Seas. But leauing these matters, let vs now shew howe euery one of the 4 foresaid parts of the Earth, that is, *Europe*, *Affrike*, *Asia*, and *America* is bounded, and howe many miles each part containeth aswell in longitude as in latitude, according to such longitude and latitude as *Mercator* and *Puteanus* do set downe in their Maps.

Europe is bounded on the North with the North Ocean Sea, and on the South with the Sea called *Mare Mediterraneum*, on the East with the flood *Tanais*, and on the West with the West Ocean Sea. *Europe* in measuring with a right line from the furthest part of *Ireland* on the West vnto the flood *Tanais*, on the East both places hauing 52 degrées of latitude, hath in longitude. 2166. miles, and in measuring with a right line from the furthest parte of *Morea* on the South, whose latitude is 35 degrées, vnto the North Sea side hauing 72 degrées of latitude, hath in latitude 2220. miles. Europa.

Affrike is bounded on the North with the straight Sea *Gibralter* and with the Sea called *Mare Mediterraneum*, on the South with a sea which deuideth *Affrike* from the south land not yet fully knowen, and on the east with the red sea or gulfe of *Arabia*, and on the west with the great Ocean Atlantique. *Affrike* in measuring with a right line from *Gambra* on the west vnto the Cape *de Gardasa* on the East, both places hauing 10 degrees of North latitude, or there about hath in longitude 4155. miles. Affrica.

And in measuring with a right line from the 50 degree of the Equinociall vnto the sea called *Mare mediterraneum*, it hath in north latitude 32 degrees, which being

multiplied by 60 maketh 1920 miles. In South latitude measuring with a right line, from th 50 degree of the Equinoctiall vnto the Cape of good hope, it hath 35 degrees, which beeing multiplyed by 60 maketh 2100 miles.

Asia. *Asia* is bounded on the North, with the North Ocean sea, and on the South partly with the red sea, which Sea according to *Pomponius Mela*, extendeth to the Isle sometime called *Taprobana* now *Sumatra*: which is a famous market place of all maner of spices. Also *Asia* is bounded on the South with diuers other gulphes & seas, as you may see in the Map: Againe on the East it is bounded with the East *Indian* Ocean, and with the straight sea of *Anian*, & on the West, it hath the floud *Tanais* and the Fenne of *Meotis*, & diuers seas, as *Bosphorus Cimmerius* the sea called *Mare Euxinum*, ỳ sea *Bosphorus Thracius* & *Propontis*, and part of the sea *Mediterraneum*, & part of the red sea or gulfe of *Arabia*, which deuideth *Affrike* from *Arabia Felix*. *Asia* in measuring with a right line from the flood *Tanais* to the promõtorie *Tamos*, both places hauing 50 degrees of latitude, hath in longitude 4284 miles, and in measuring with a right line from the 150 degree of the Equinoctiall vnto the promontory *Tabin*, *Asia* hath in North latitude 76 degrees, which being multiplied by 60 maketh 4560 miles.

America. *America* is bounded on ỳ North, with the North Ocean sea, and on the south, with ỳ sea called *Mare Magellanicum*, on the East with the great Ocean Atlantique, & on ỳ west with the *West Indian* Ocean, & the strait sea of *Anian*. *America* in measuring with a right line frõ the straite of *Anian* to the furthest part of *Estotilant* vpon ỳ 64 degrée of latitude, hath in longitude 4342 miles, & in measuring with a right line from the 270 degrée of the Equinoctiall vnto the North sea, it hath in North latitude 76 degrées, which maketh 4560 miles, and yet the quantitie of the ground described in the Mappe, is not so great as the o-

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ther by a seauenth part: wherein I can very well excuse the Mappe-makers, not hauing perhappes as yet the true longitude of that part of *America*.

Finally, in measuring with a right line from the 310 degrée of the Equinoctiall vnto the sea called *Mare Magellanicum*, it hath in the South latitude 52 degrees, which maketh 3120 miles.

Now if you would know what kingdomes, Regions, Cities, Mountaines, Flods, Lakes, also what seas together with their Islands, Ports, Capes, Points, & baies doe belong to euerie one of the forsaid foure parts, then studie well these moderne Maps: and with your eie you shall beholde, not onely the whole world at one view, but also euery particular place contained therein. Which to describe at the full, in writing would require a long time Wherefore leauing that to your owne Industrie, I will shew you how to finde out the longitude and latitude of anie place in the Mappe.

Also to know how one place lieth from another, and with what wind you haue to saile from one place to another. And finally how to finde out the true distaunce betwixt place and place, in which thinges the chéefe vse of Mappes doth consist.

And first you haue to vnderstand, that the Meridians which you sée in the Mappe, doe serue for diuers purposes. For you learne thereby that it is noone-tide or midday sooner to one place then to another, by marking what Meridian is more towardes the East, which the Sunne alwaies toucheth sooner then that Meridian which is more towardes the West. Also by the Meridians you know how the Eclipse of the Moone appeareth sooner to one place then to another, & with what variety of time.

For they whose Meridian is towards the West, doe séeme to sée the Eclipse of the Moone sooner then they whose Meridian is more towardes the East, whereas in verie truth the Eclipse of the moone is séene to all places

(where it can be ſéene) at one very inſtant of like greatnes, & yet ſéemeth to be ſéene later or ſoner, by reaſon of the diuerſitie of the time of the day, in places ſtanding one Eaſt or Weſt from another. And if the diſtance betwixt thoſe two Meridians doe containe 15 degrées of the Equinoctiall, then the Eclips appeareth to bee ſoner to the one then to the other by one whole howre. For euerie 15 degrees maketh an howre, and therefore looke how manie 15 degrées you finde betwixt the two Meridians, ſo many howers are to be accounted. And if you find fewer degrées, then the time of the Eclips is to be ſhortned accordingly, and by attributing 4 minutes of an howre to one degrée, (for foure times 15 maketh 60 minutes, which is alſo one howre) you may make your account ſo ſmall or great as you will. And note alſo that you may conceiue to be in the Mappe as many Meridians as there are degrées in the Equinoctiall.

As for the Eclipſe of the Sunne, it is ſéene, neither generally, nor fully at the ſelfe ſame time, nor yet of the ſame greatnes in all places. Indéed it appeareth ſooner to the Weſterne Countries, then to the Eaſterne. But the diuerſitie of the time of appearance doth depend not onely of the number of Meridians betwixt the two places, but alſo of the ſwift or ſlowe motion of the Moone, which comming betwixt vs and the Sunne, taketh the ſight of the Sunne from vs.

Moreouer, by the Meridians you ſhall knowe what longitude any place in the Map hath, by doing thus. Firſt ſet the one foot of your compaſſe in the place it ſelfe, and the other in ſome Meridian that is next vnto it, whether it bee on the left or right hand, it maketh no matter: and from thence drawe downe your compaſſe following ſtyll that Meridian vntill you come to the Equinoctiall lyne, and there marke vpon what degrée of the Equinoctiall that foote of your compaſſe which you did firſt put in the place, doth reſt & there make a pricke. That done, count

how

how many degrees that is diſtant from the firſt Meridian, and that is the true longitude of the place: and that longitude ſerueth to al the places that be vnder that Meridian, though they be neuer ſo farre diſtant one from another North and South.

Now if you would know the latitude of any place in ỹ Map, that is to ſay, how far it is diſtant frō the Equinoctial, either Northward or ſouthward, either of which latitudes cōtaineth 90 degrees. then do thus: ſet ỹ one foot of your Compaſſe vpon the verie place, and the other vpon that Paralel which is next it, whether the Paralell be aboue it or beneath, it maketh no matter, and drawe your Compaſſe from that place following ſtil that Paralel vntill you come to that Meridian, which is marked with the degrees of latitude, which Meridian in the latter Maps, ſtandeth ſomewhat more Weſt then the firſt Meridian dooth. And marke vpon what degree that foote of your Compaſſe which you did drawe from the place doth reſt, and there make a pricke. That doone, count how manie degrees that pricke is diſtant from the Equinoctiall, and that is the true latitude of that place. And the like latitude haue all they that dwell vnder that Paralell, howe farre ſo euer they dwell aſunder, Eaſt and Weſt. And by knowing the latitude of any place, you may quickly finde alſo in ſome Mappes vnder what Clime or Paralell ſuch place is ſcituated, and of howe many howers the longeſt day is there, as in the Mappe of *Vopellius*, of *Gemma Frizius* and diuers others. But in theſe latter Mappes ſuch things are not ſet forth, wherefore not hauing the other maps, you may reſort to the tables ſet down in my ſphere, which doe ſhew all ſuch things at the full.

¶ Now to know how one place beareth from another, & with what a ſhip is to be directed from one port to another, & alſo what diſtance is betwirt 2 places, that is, how many miles one place is diſtant from another, the latter Coſmographers, as *Mercator*, *Barnardus*, *Puteanus*, and

diuers others haue inuented a newe instrument called *Organum directorium*, which they set down in their Maps togither with the vse thereof. But in mine opinion not plainely inough for most mens capacitie. This Instrument containeth 2 Quadrants of a Circle, hauing the names of the windes written therein: And they call the vpper Quadrant *Organum Superius*, & the nether Quadrant *Organum Inferius*. Which 2 Quadrants haue 2 lines marked with degrees, and are ioyned togither with a right angle, of which 2 lines the standing or hanging line on the left hand doth signifie the first Meridian, & is marked with 75 vnequall degrées of latitude, in such proportion as ỳ middle Meridiã of the Map hath. The other line which lieth ouerthwart, signifieth the Equinoctiall, and is marked with 90 equall degrées of longitude. But the spaces of the Paralels of latitude are in number 7 and a halfe, euerie whole space containing 10 degrees, and the halfe space but 5 degrées. Which spaces are wider and wider towardes the Pole, and of like proportion to those of the Mappe.

Organum directorium

And note by the way that the highest right line that goeth from the first Meridian towardes your right hand, is the East line, and the nethermost line signifiyng the Equinoctiall is the West line. For the vpper Quadrant commeth towards you from East to South, and the nether Quadrant goeth from you towardes the left hand from west to south, & in the center of ech Quadrant must be put a long thread to shewe the direction from place to place. The vse of this Instrument is thus: first hauing found out in the Map the seuerall longitudes, & latitudes of 2 places in such order as is before taught, séeke the latitude of the first place in the first Meridian, & there make a marke. I call here the first place, that from whence you go, and the second that to which you go. That done, seeke out in the said Meridian the latitude of the second place, & there make another marke. And from that marke of the

second

second place draw a right line towards your right hand, so as it may be a Paralel to the Equinoctiall line. Then take the difference of the 2 longitudes by substracting the lesser out of the greater, & seeke out the degrees of that difference in the Equinoctiall line, and there make a marke from which marke draw a right line that may be a Paralel to the first Meridian. And whereas this line crosseth the first line there set downe a marke, then drawe a right line from the marke of the first place, so as it may passe through the crossing point. That done, if the latitude of the first place be greter then that of the second place, make a Paralell to that line with the thread of the vpper quadrant, but if the latitude of the first bee lesser then the second, then make a Paralell vnto the said line with the thread of the nether Quadrant, which with the helpe of your Compasse you shall easily do. And that thread being stretched out amongst the winds, wil shew by what wind the second place beareth from the first. And the opposite wind is the director wherby you haue to saile: yet neither *Mercator* nor *Barnardus* do plainely shew how to find out the true distãce of 2 places by this instrument, nor yet do set down in their Maps, either scale or tronke to take the distance betwirt 2 places with the compasse, as most commonly al other Maps & Mariners Cards haue, but do refer the plaine declaration thereof to other their bookes and tables which I haue not yet seene, & therefore in the meantime I thought good to set downe according to *Barnardes* rule, this briefe way of finding out the distance of any 2 places whatsoeuer is set down in their Maps. First with your Compasse, take the iust distance of the two latitudes vppon the first Meridian, which is otherwise called the difference of the latitude. And hauing layd a ruler or thread to the places, looke howe many times the foresaid distance, or difference taken with your Compasse, is comprehended in the space that lyeth betwirt the two places, and by so many times multiplie the layd difference,

the product whereof beeing multiplied againe by 60, will ſhew howe many miles the one place is diſtant from the other. As for example, the diſtance or difference betwixt the two latitudes of *London* and *Hieruſalem*, is 19 degrées or there abouts, which being taken with your compaſſe you finde to be two times contained in the ſpace betwixt *Hieruſalem* and *London*. Wherefore in multiplying 19 degrées by 2 you find the product to bee 38 which being multiplied by ſixtie, maketh 2280 miles, and ſo farre is *Hieruſalem* from *London* by a right line. But if in meaſuring the diſtance betwixt 2 places with your Compaſſe there remaine any odde ſpace not fully anſwering the firſt widenes of your Compaſſe, then take that odd ſpace with your Compaſſe beeing ſtraightned and made fit therevnto, and looke how many degrées the ſaid odde ſpace comprehendeth in the firſt Meridian, about the midſt of the degrées of the foreſaid difference of latitude, adde thoſe degrées alſo to the reſt which you haue already meaſured and multiplied, and by multiplying the whole ſumme by 60 you ſhall haue the true diſtance.

Againe, it may be that the two places doe not differ at all in latitude but onely in longitude, for as I haue ſayd in my ſphere, 2 places may differ three maner of waies, that is in latitude onely, in longitude onely, or in both. And there I doe ſhewe howe euery one is to bee meaſured.

But becauſe that order of meaſuring is ſomewhat buſie to ſuch as are not very wel exerciſed in Arethmeticke, and alſo doe knowe the vſe of the tables of ſines called in Latin *Tabulæ Sinuum*, I thought good to ſet downe here a more eaſie waie of meaſuring, though perhaps not altogether ſo iuſtlye, and yet without any great errour. Wherefore if the two places doe differ both in longitude and latitude, then you muſt doe as before is taught. But if they differ onely in latitude, then you haue no more to doo but to multiplie the difference of the two latitudes

titudes by 60 miles, and if there bee any odde minutes, then to allow for euery minute one mile. As for example, *Compostella* and *Lisbone*, two townes, the one in *Spaine*, the other in *Portugale* haue one selfe same longitude differing onely in latitude, which difference is foure degrees, and 20 minutes.

Here if you multiple 4 by 60 it amounteth to 240 miles, whervnto by adding 20 miles for the 20 minutes, you shall finde the whole summe to be 260 miles, which is the distaunce by a right line betwixt *Compostella* and *Lisbona*.

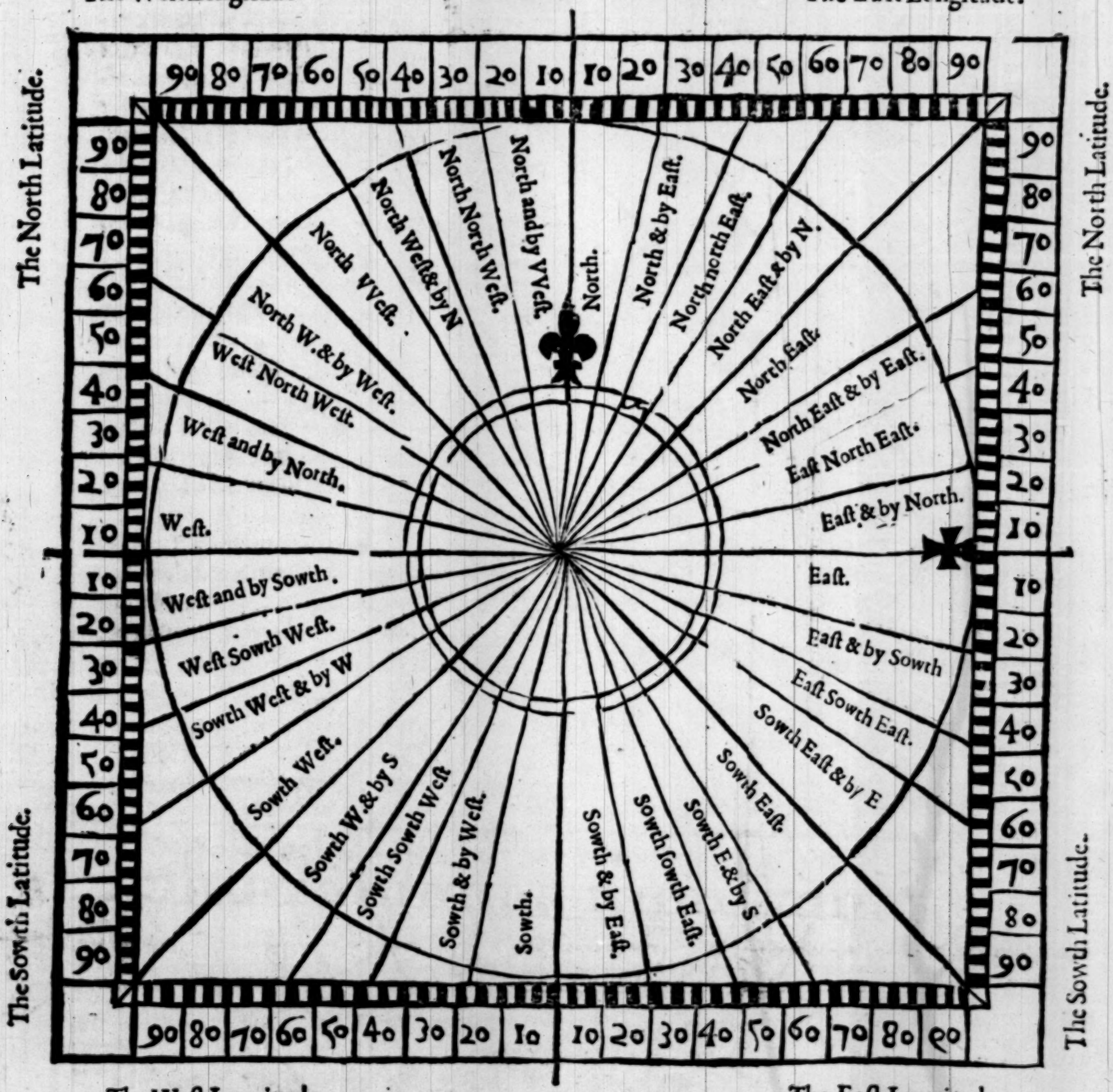
But if the two places hauing one selfe latitude, doe differ onely in longitude, then looke howe many such degrées as are of equall quantity to the last degree of the same latitude are contained betwixt the two places by a right line, and by allowing for euery degree 60 miles, you shall haue the true distance, or at the least not much differing from the truth. And if you sée that the two places in the mappe doe stand far a sunder, then for the more spédines, take with your compasse fiue such degrées at once, being first prickt vpon a péece of paper which is iust 300 miles, and at the widenes meásure the sayd space, and if there remain at the last any odd space, then straighten your Compasse and fit them to that odde space, and loke how many of the foresaid degrées that comprehendeth, and hauing multiplied the same by 60 adde the product thereof to the former summe. As for example, *Compostella* and *Constantinople*, hauing one selfe same latitude, that is 43 degrees of North latitude doe differ onely in longitude: Heere with my Compasse I pricke vppon a péece of paper 5 degrees like in quantitye to the last and vppermost degrée of the foresaide 43 degrees, and measuring with the widenes of my compasse the space betwixt the two places by a ruler or right line I finde that space to comprehend the foresayd widenes of my compasse 6 times, which maketh 1800 miles, and that there re-

maineth an odde ſpace containing 3 of the foreſaide degrees, that is, 180 miles, which beeing added to the former ſumme, maketh in all 1980 miles, which is the diſtance betwirt *Compoſtella* and *Conſtantinople*. Alſo if you would knowe the diſtance betwirt two townes in *Affrike*, the one called *Budonell* ſtanding vpon *Capo viride*, & the other called *Ercoco*, ſtanding hard by the red ſea, both places hauing one ſelfe ſame latitude, that is to ſaye 14 degrées of North latitude, or there abouts, and doe differ onely in longitude. Then pricke with your Compaſſe vpon a péece of paper 5 degrées, euerie one equall to the laſt degrée of the forelaid latitude. And in meaſuring the ſpace betwirt thoſe two places with that widenes of your Compaſſe, you ſhall finde the ſame to bee comprehended in the ſaid ſpace 12 times, which by allowing 300 miles to euery widenes amounteth to 3600 miles, and the ouerplus of the odde ſpace being 2 degrees, is 120 miles, which being added to the former ſumme, maketh in all 3720 miles: and that is the diſtance betwirt *Budonell* and *Ercoco*.

And if this way like you not, then multiply the difference of the 2 longitudes, by the miles anſwerable to the latitude of the ſaid places, which you ſhall find in a ſpeciall table made for that purpoſe, & is ſet downe in my ſphere, togither with the rule and order that is to bee obſerued therin. The hardeſt of which 2 waies in mine opinion, is much more eaſie than that which is to bee done by the former Inſtrument called *Organum directorium*. Which inſtrument *Mercator* and *Barnardus* did borrow as it ſeemeth to mee from that which *Gemma Frizius* calleth his *Quadratum Nauticum*, inuẽted by him many yeres ſince: the ſhape, deſcription and vſe whereof, I thought it not amiſſe to ſet down here and the rather for that in mine opinion it ſheweth both the true courſe and direction to anie place more ſpéedily, and with more facility then the other.

Here

Here followeth the Mariners Quadrant.



A DISCIP.

A DESCRIPTION OF GEMMA FRIZIus his Instrument called Quadratum *Nauticum.*

THis square by 2 right lines called Diameters crossing one another with right angles in the very Center is deuided into foure Equall quarters, and within the said square vpon the said Center is drawne a Circle, which by meanes of the two foresaid Diameters is also deuided into foure Quadrants, and euery Quadrant is subdiuided with right lines into 8 partes, so as in all, there be 32 lines, signifying the 32 winds of the Mariners Compasse. Euerie line hauing his proper name of wind written theron. And note that the right line which is drawne right downe in the middest of the square, signifieth the Meridian, shewing the Northpoint aboue, and the South point beneath, and the other right line, crossing the same in the Center, signifieth the Equinoctial line, which sheweth the East point on the right hand, and the West point on the left hand, and the Circle it selfe signifieth the Horizon.

Now you haue to vnderstand, that from the Equinoctiall line vpwards the 2 sides of the square are deuided each of them into 90 degrees of North latitude, and the other two sides from the Equinoctiall downeward, are likewise deuided on both hands into 90 degrees of south latitude. Then the head or front, & also the base of the said square is deuided in the middest by the foresaid Meridian line into 2 equall parts, wherof the first proceeding from the said Meridian towardes the right hand is deuided as well aboue as beneath into 90 degrees of longitude, and that is called the East longitude, and the other part proceeding from the said Meridian towardes the left hand is likewise deuided as well aboue as beneth into 90 degrees

of

of longitude, & is called the West longitude. The vse of which instrument is thus: first knowing by some table or Mappe, the longitude and latitude of two places, take the difference of both by substracting the lesser out of the greater. And if the longitude of the second place bee greater then the first, seeke the difference thereof in the front, and also in the base of the East longitude on the right hande. But if the longitude of the second place be lesse then the first, then seeke the difference thereof in the West longitude on the left hand. And here as before I meane by the first place that from whence you goe, of which 2 places, the first is alwaies supposed to bee in the very center of the Circle, and the other is to be found out thus: first, hauing sought out the degrees of the difference of the longitude, as well in the vpper part as in the nether part, and marked the same with one pricke aboue, and another beneath, applie your Ruler or a thread to those 2 pricks, or els drawe a secret right line from the one pricke to the other by a ruler. That done, seeke out the difference of the 2 latitudes on both sides of the square, that is to say, if the second place hath greater latitude then the first, then you must seeke the difference in the North latitude, if lesse, then seeke that in the South latitude. And hauing marked the same on both hands, by setting down on each side a pricke, drawe a secret right line from marke to marke, and where the last line crosseth the first line, there make a marke, for there standeth the place whereto you would goe. Which if you would know how it beareth from the first place, then lay your ruler both to the Center and also to that marke, drawing a right line passing through the Center, and also through the said marke from the one side of the circle to the other, or els stretch a thred through the Center and the marke, and on that side that the mark is, you shall see the name of the winde that sheweth how the second place beareth from you, the opposite point whereof is the winde whereby you haue to saile. As for example,

ample, if you would knowe howe *Venice* beareth from *London*.

Nowe if you ſéeke in the Mappe, you ſhall find *London* to haue in longitude 23 degrees and 0 minutes, and in latitude 51 degrees, and 32 minutes. Againe, you ſhall finde *Venice* to haue in longitude 36 degrees, and 30 minutes, and in latitude 45 degrees and 15. minutes or there abouts.

The difference of the longitudes is 13 degrees and 30 minutes, which becauſe the longitude of *Venice* is greater then the longitude of *London*, you muſt ſeeke it out in the Eaſt longitude on the right hand, and marke the ſame both aboue and beneath. Againe, the difference of latitude is 6 degrees and 17 minutes. Which becauſe *Venice* hath the leſſer latitude, ſéeke that out in the South latitude, marking the ſame on both handes. That doone, lait two threads, or els drawe two right croſſe lines from the foreſaid markes, and where thoſe two threads or lines doe croſſe, make a marke, which marke ſignifieth the place whereunto you would goe, which is *Venice*.

Then from the one ſide of the Circle to the other, lay a ruler or thread paſſing through the center, and the ſaid marke made for *Venice*, at the end of which thread, ruler, or line on the right hande you ſhall ſée the winde which ſheweth how *Venice* beareth from *London*, and on the left hand ẏ wind, wherby you haue to ſaile, if ẏ ſpace betwixt ẏ 2 places were al ſea. For in ſailing by ſea, you may not thinke to go alwaies by a right line, but often to chaunge your courſe according as either mainland, hedlands, Ilés Currents, Sandes, Rockes, or ſuch like impedimentes ſhall giue occaſion: and therfore though your right courſe from *London* to *Venice* is to go Southweſt and by Eaſt, yet being come out of the *Thames* to *Douer*, your courſe from thence to the Cape of *Britaine* is weſt Southweſt. And from thence to the Cape *Finis terræ* in *Spaine*, it is

Southwest and by South. And from thence to the cape saint *Vincent* in *Portugale* you go right South: and from thence to *Gibralter* almost East Southeast. Againe from *Gibralter* to the South point of *Sardignia*, your course is almost East and by North. And from thence to the south point of *Sicilia* almost East Southeast: and from thence to *Corfu*, your course is iust Northeast, and from thence to *Venice*, you turne againe Northwest.

Thus you see that in going by Sea, one course doth not holde, no nor yet in going by Land, sith Mountaines, Riuers, and lakes may put you out of your right course, and yet it is necessary to know how the place whereto you go, beareth from you to the intent that being out of your way, you may alwaies the better direct your course right againe to the same.

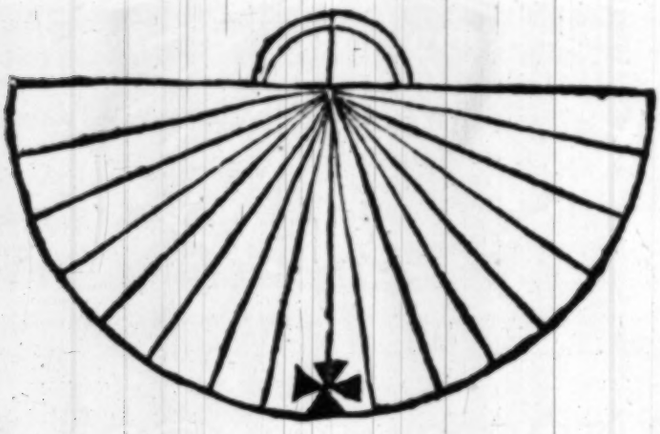
Moreouer, *Gemma Frizius* sayth, that by this Instrument you may also finde out the difference of longitude betwixt the two places from whence and whither you goe, so as you know before how the second place beareth from the first, and also the difference of their latitudes. As for the latitude of each place, you may easily finde the same with your Astrolabe, Quadrant, or crosse staffe, by taking therewith the Meridian altitude of the Sunne, or the highest altitude of some starre that you know: The order whereof I haue set downe in my Sphere. And the Coast of the Countrey and place whereunto the Shippe is to bee directed, is commonly well knowen to the Mariners how it beareth from the first, and specially hauing a prosperous wind.

Then knowing these two things, you must do thus: First hauing drawen a secret line or thread, from the difference of the two latitudes, placed according to the rule of greater and lesser before set downe, and marked on both sides of the Instrument: draw another thread, or els lay a ruler so as it may passe thorough the Center, and the line of the wind, or coast whereby the second place beareth

reth from the firſt. And whereas thoſe two lines or threds doe touch, make a marke, and then lay a ruler, or extend a thread from the vpper line to the nether line of longitude, ſo as it may paſſe hard by the laſt marke: and then the thread or ruler ſo laid, will ſhew you the difference of longitude betwixt the two places. And by this meanes *Gemma Frizius* ſayth, that the Mariners may eaſilie correct the longitudes of places as they ſaile: but how truely, I referre that to the ſkilfull Pilots.

But for mine owne part, hauing to ſeeke out in theſe latter Mappes the way by Sea or Lande to any place I would vſe none other Inſtrument of direction then halfe a Circle deuided with lines like a Mariners Flie, in ſuch ſort as you ſée in this Figure.

THE FLIE, THE VSE VVHERE-of here followveth.



THis Flie containeth two quarters of the Mariners Compasse. the middle line whereof marked with a Crosse, signifieth the line which runneth East and West. For if the place whereto you goe, be on your right hand, then the Crosse signifieth the east point, but if it bee on your left hand, then turning the Flie towardes your left hand, the Crosse doth signifie the West point, and the right downe line crossing the foresaide middle line with right angles in the very Center, is the Meridian line shewing the North and South, according as you turne the Crosse East or West.

The vse of which Flie is thus; first with a pin or a needle, being thrust through the center of the Flie, pricke the pin down in the very place from whence you go, called before

foꝛe the firſt place, and if the ſecond place bee on your right hand, then turne the croſſe of your Flie that way, but ſo as the Meridian of the Flie may be a true Paralel to the next Meridian of the Mappe that is on your left hand, which your compaſſe will quickly perfourme by taking therewith a iuſt ſpace at both ends of the Flie betwixt the two foꝛeſayd Meridians. That doone, extend your thꝛead ſo as it may paſſe thꝛough both the Center of the Flie hard by the pinne, and alſo thꝛough the ſecond place, and then looke vppon what winde oꝛ coaſt of the Flie the thꝛead lieth, and that wind ſheweth how the ſecond place beareth from you. And the oppoſite winde thereof ſheweth by what winde you haue to ſayle thither.

But if the ſecond place be on your left hand, then you muſt turne the croſſe of the Flie towards your left hand, and hauing ſet downe the Center of the Flie in the firſt place, and with your Compaſſe made the Meridian of the Flie a iuſt Paralell to the next Meridian of the Map that is on your right hand, lay your thꝛead to the two places as befoꝛe, and marke vpon what wind of the Flie it ſtriketh, and you ſhall haue your deſire. The leſſer that your flie be, the better, foꝛ being great it would couer too many places of the Carde oꝛ Mappe. But if the two places ſtand ſo nigh togither, as the Fly dooth cover them both, then hauing ſet downe your pinne in the firſt place, make your thꝛead with a Nooſe, & hauing put the ſame ouer the pin, dꝛaw the thꝛead thꝛough ỹ ſecond place ſomwhat beyond the Compaſſe of the Flie, and holde it there faſt vntill you haue alſo put the Center of the Flie ouer the ſayd pin oꝛ nædle, and duely placed the ſame in ſuch fourme as is beforꝛe taught: and in ſo dooing, that line of the Flie which lieth vpon the thꝛead will ſhewe your courſe and direction aſwell as if the thꝛead lay aboue the Flie.

Trulie I doe thinke the vſe of this Flie a moꝛe eaſie

and speedie way of direction, then the manifolde tracing of the Mappes or Mariners cards with such a number of crosse lines, as commonly are drawen therein, causing rather a confusion then otherwise: for in such Cardes as are made with right Meridians, you shall find the Flie to to bee much more seruice-able then these manifolde lines.

The vse of *Ptolomeis* Tables.

THus much touching the vse of Mappes and Cards, now according to my promise, I wil briefly shew you the the vse of *Ptolomeis* Tables, or of any other table made in the forme. The chiefest point wherof is redily to find out any place that you seeke, and to know where it standeth. For the accomplishment whereof, you must first knowe what longitude and latitude that place hath.

The longitudes and latitudes of all places described by *Ptolomey*, are set downe in his second, third, fourth, fift, first, and seuenth booke of Geographie. For in his second booke he describeth the West part of *Europe*, containing *Ireland*, *England*, and *Scotland*, *Hispania*, *Gallia*, *Germanie*, *Hungarie*, and *Slauony*. In his third booke, he describeth the East part of *Europe*, as *Italie*, *Sicilia*, *Corsica*, *Sardigna*, *Sarmatia*, *Taurica*, *Peninsula*, *Datia*, *Misia*, *Thracia*, *Macedonia*, *Achaia*, *Peloponesus*, *Candia*, *Rubia*, & diuers other Lands and Ilands. And hee containeth all *Europe* in ten Tables. In his fourth booke he describeth *Affrike*, that is to say, so much as was known in his time, containing the same in 4 Tables. In his 5. 6. and 7. booke he describeth all *Asia* and the *East Indians*, whereof hee maketh 12 Tables, and in describing any Region or prouince,

ninee, he sheweth how it is bounded both North, South, East, and West. And also what notable Cities, Floods, Lakes, or Mountaines bee in euerie Region, and therewith setteth downe the longitude and latitude of euerie place: To which his booke, diuers haue made certaine Alphabeticall tables, containing the names of all the places that are mentioned in the foresaid books, shewing in what leafe to finde the same: to the intent that you may the more readily find out, not onely the place, but also the longitude and latitude thereof, and in what Table it is contained.

Notwithstanding, I knowe by good triall, that there are a number of places mentioned in the saide bookes, which you shall not finde in the foresaid Alphabet.

Wherefore I wish that *Mercator, Ortellius, Barnardus, Brugensis,* or any other of the latter Cosmographers and letters foorth of Mappes and Cards, would take the paine to make a generall Alphabet, containing all the names that are to bee found and knowen, both auncient and moderne, of Regions, Cities, Seas, Floods, Lakes, Riuers, Portes, Baies, Hedlandes, Capes, Mountaines, and all other notorious places contained in their Maps and Cardes, togither with the true longitude and latitude annexed to euerie place, agreeable to their Maps, to the intent, that euerie man delighted with the reading of Hiſtories, may in their Mappes both generall and speciall, easilie finde out anie place that hee seeketh. Which worke in mine opinion would bee most thankfullie receiued of all those that delight in Geographie, to the great commendation and prayse of the Authours thereof.

For though *Ptolomey, Appian, Gemma Frizius, Gastaldus, Orontius, Munsterus, Ortellius* and others haue set downe certaine names, both auncient and moderne togither with their longitudes and latitudes, yet they are but very scarce in comparison of all the names that

are

are wanting, yea or of those that are comprehended in their own Cards and Mappes, all which Maps I would wish to agree in their longitudes and latitudes: for otherwise a man shall hardly finde the place which hee seeketh.

Wherefore I pray God with all my heart, that some good man that is a skilfull Cosmographer may shortlie traueile heerein to the profit of all Students in Geographie.

But now to returne to my matter, which is to shew how to find out any place contained in *Ptolomeis* tables, I say that you must first finde out the name of the place in the Alphabet, and that will direct you to the booke wherein it is set down, togither with the longitude and latitude thereof. And there also you shall find in what table it is contained.

Then hauing taken a note of the longitude and latitude, and also the number of the table wherein it is to be sought, resort to that table, bee it in *Europe*, *Affrike* or *Asia*. In the front of euerie which table, and also in the base are set down certaine numbers of longitudes, in such sort as the vttermost and nethermost be like numbers, and do directly answere one another. Againe, on both sides of the table are set downe certaine numbers of latitude like in quantity, and directly answering one another.

Then seeke out the longitude of the place which you would find in the front, and also in the base, and marke the same with two pricks, one aboue, another beneath. From which two pricks, lay a ruler or extend a thread, holding it fast there vntill you haue found out the latitude of the place on both sides of the table, which beeing also marked on each side with a pricke, extend another thread from those two last prickes, and in that very point wheras the two threads do crosse, you shall find the place to be which you seeke, or at least should be there. Moreouer, on the right hand of euerie table, *Ptolomey* setteth

downe

downe moſt commonlie vnder what Clime and Paralel euerie place is, and by that meanes you may alſo knowe the longeſt day that any Paralell hath. For as I haue ſayd before in my Sphere, euery Paralell proceeding from the Equinoctiall towardes the Pole, encreaſeth by one quarter of an houer, and euery Clime containing two Paralels, encreaſeth by halfe an houer.

Of which Climes *Ptolomey* ſetteth downe but ſeuen, but of Paralels he maketh 21 in ſuch order as this table following ſheweth, which Table conſiſteth of foure Columns, whereof the firſt containeth the ſeuen Climes togither with their names; and alſo howe many miles euery Clime hath in breadth. And the ſecond containeth 63 degrées of latitude, further then which Northward, *Ptolomey* his Tables do not extend.

The third containeth the numbers of the 21 Paralels, and the fourth the houers and minutes of the longeſt day in euerie Paralell.

	The seuen Climes, their names, and miles in breadth.	The degrees of latitude.	The 21. Paralels.	Of the longest day in euery Paralell. The howers & m.
		63 *	21	19 30
			20	19 0
		60	19	18 30
			18	18 0
7	Dia Riphios. 195. Miles.	50	17	17 30
			16	17 0
6	Dia Boristenes. 225		15	16 30
			14	16 0
			13	15 30
5	Dia Romes. 240.		12	15 0
			11	14 45
4	Dia Rhodou. 350.	40	10	14 30
			9	14 15
3	Dia Alexandrias. 370.		8	14 0
		30	7	13 45
			6	13 30
2	Dia Sienes. 420.		5	13 15
1	Dia Meroes. 465.	20		
			4	13 0
			3	12 45
			2	12 30
	765.	10		
			1	12 15

* The Equinonctiall line, vnder vvhich these that dwell haue no Latitude, and therfore they haue alwaies 12. howers day, and 12 hovvers night.

But you haue to vnderstand, that whereas *Ptolomey* maketh the furthest North part of his seuenth Clime called *Dia Ripheos* to haue but 50 degrees and 30 minutes of latitude, the moderne Cosmographers doe allowe to those mountaines 70 degrees of latitude, affirming the same to bee those selfe Mountaines which are otherwise called *Montes Hiperborei*, which because they enclose a great part of the North side of the world, are called *Orbis terræ cingulum*, that is to say, the girdle of the worlde, the wrong latitude whereof and of diuers other, I thinke *Ptolomey* had from others and not from himselfe.

For being brought vp in so warme a soile as *Alexandria* standeth in, he could neuer endure to go so far northward, to take the latitude of those colde *Riphean* Mountaines, and therefore if you list to knowe what latitude doth truly belong vnto euerie Clime and Paralell, then resort to *Orontius* his Table of Climes and Paralels set downe in my Sphere, which sheweth how many degrees of latitude euery Paralell hath, togither with the longest day, euen from the Equinoctiall to the very Pole, wherefore I leaue to speake heere any further thereof, and so for this time ende this Treatize, which if I shall perceiue to bee thankfully taken, I minde (God willing) to put in print, the description and vse of the Sphere and of the Globe, both Celestiall and Terrestiall. Also a verie plaine and briefe Arithmetike, togither with the discription, and certaine vses of the Tables of Sines, called in Latin *Tabulæ Sinuum*. And finally, the principles of Nauigation more plainely (I beleeue) than euer there haue beene heretofore taught, onely to helpe and further such as bee desirous to trauelle by Sea, and haue not bene exercised in the Mathematicall Disciplines, without some knowledge whereof, it is hard to bee skilfull in that Art.

FINIS.